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(54) Motor-driven rocking device eg for a baby's chair, hammock or crib

(57) The device 4 includes a motor 7, having an output shaft 8 with an arm 9 extending from it. A pendulum weight 10 is attached to the extreme end of the arm 9. In use the device is firmly clamped firmly on to the support rail 5 of the chair and the motor 7 is switched on; the rotary pendulum weight 10 creates an oscillating movement, which causes the chair to rock or bounce. The speed and duration of rocking may be preselected.

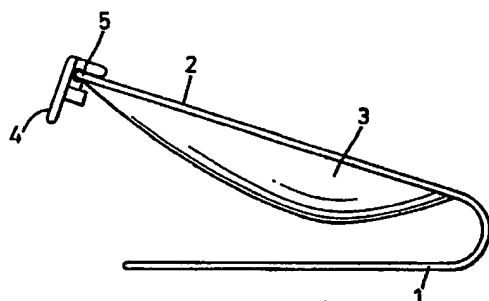


Fig. 1A

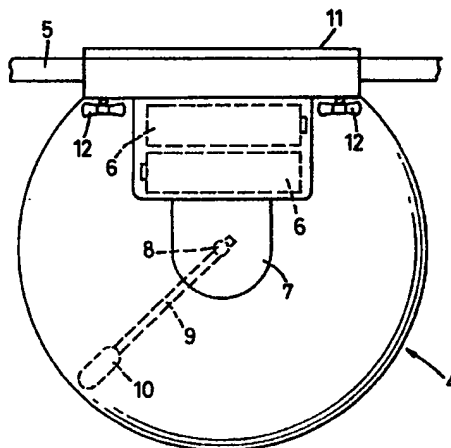


Fig. 3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

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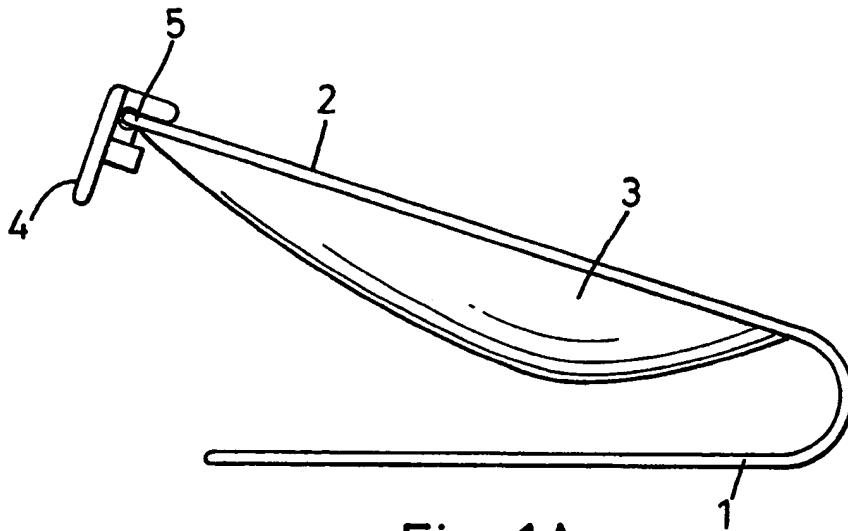


Fig. 1A

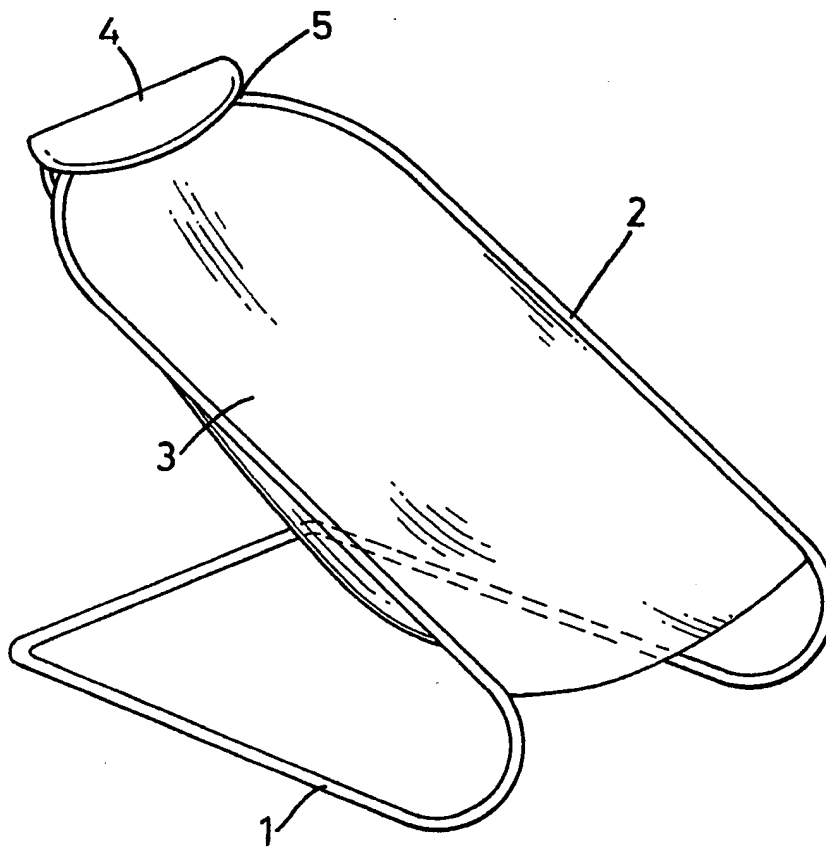


Fig. 1B

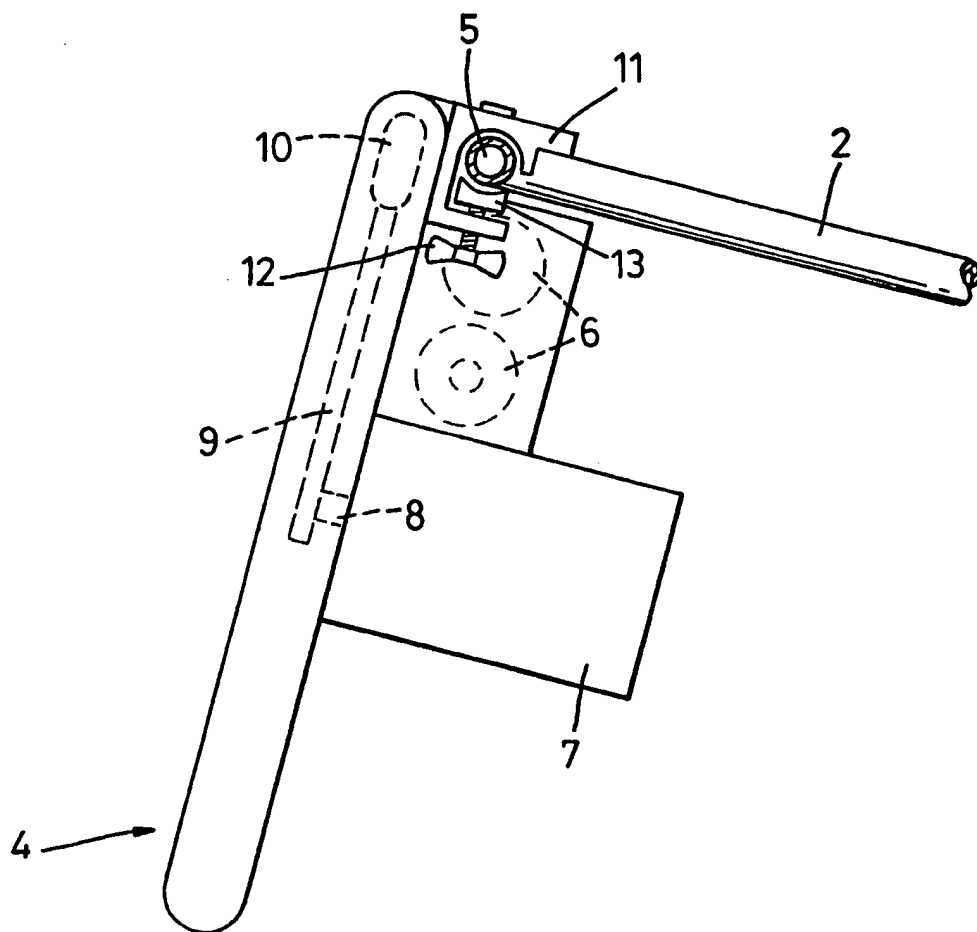


Fig. 2

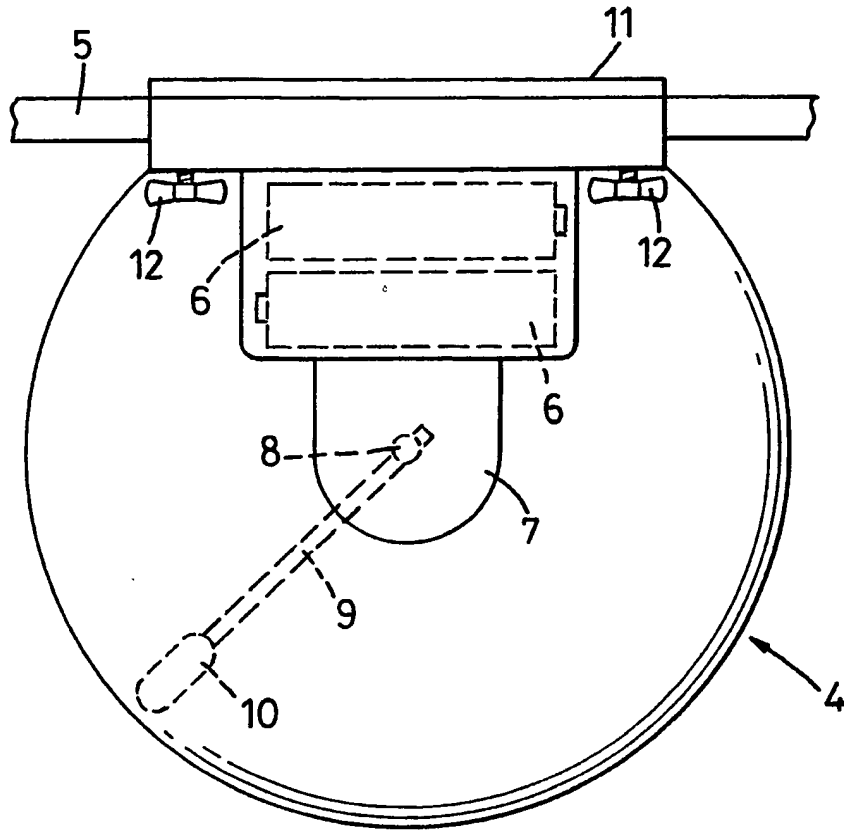


Fig. 3

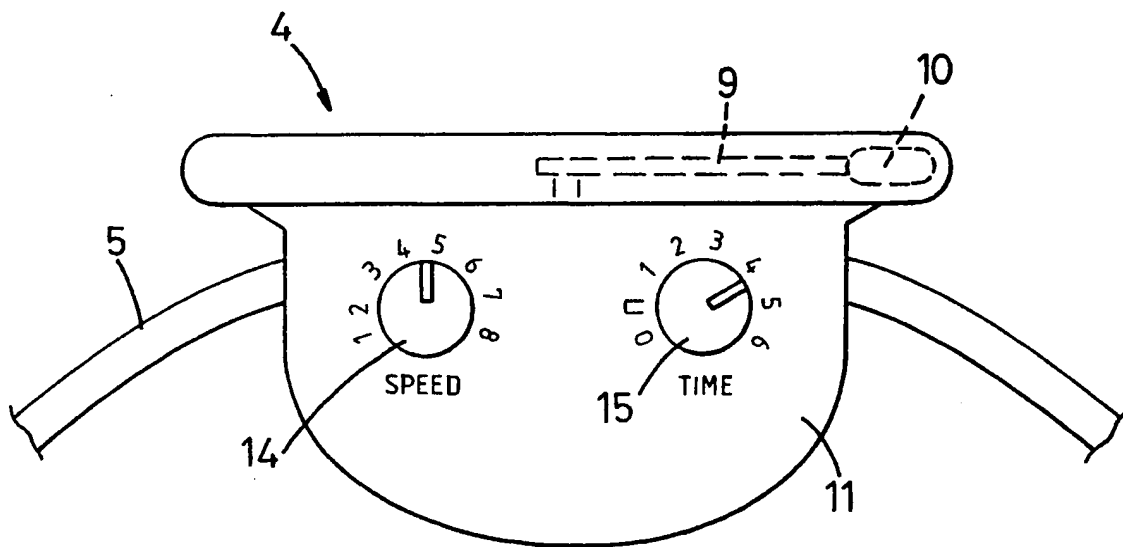


Fig. 4

"Improvements relating to Rocking Devices"

There are on the market today many forms of rocking or bouncing chairs or other rocking devices to soothe babies up to the age of nine months. Such chairs generally act on a cantilever principle to magnify the baby's movement and create a gentle rocking motion. However they do require the presence of someone to create and maintain the rocking movement. It is an object of this invention to provide a device whereby such rocking can be maintained by automatic means.

According to the invention there is provided a device for initiating and maintaining a rocking motion to a rocking chair and comprising a mounting unit incorporating a rotary oscillator weight and a drive motor for imparting a rotary drive to the oscillator, and clamping means for removably attaching the mounting unit to a remote part of the rocking chair such that the direction of the axis of rotation of the drive shaft of the drive motor has a major component at right angles to the vertical.

Ideally the device will be formed so that when it is mounted onto the chair the oscillator weight will rotate in a generally vertical plane, though an angle of up to  $45^{\circ}$  from the vertical would still allow the device to operate to some extent. Reference to a remote part of the rocking chair is intended to mean a position remote from the rockers on which the chair is mounted or pivot points about which it is intended to rock. The "rocking chair" is a general term

which could, for example, relate to a hammock like device depending from pivot points or a crib mounted on rocker supports.

The oscillator may comprise a pendulum weight on an arm projecting generally at right angles from the drive shaft of the drive motor. A possible arrangement is a 20 gram weight at the end of a 70 mm length arm, though shorter arms with larger weights (or vice versa) could be employed. As a possible alternative the oscillator could be a disc onto which the drive shaft of the drive motor is fixed at a generally central position of the disc, but such that the weight of the disc is imbalanced with respect to the drive axis. An imbalance weight could be formed at or near a portion of the perimeter of the disc.

The drive motor may be a clockwork motor or a battery driven electrical motor. Ideally a timing member will be provided to enable the time of operation of the drive motor to be determined. An operating time of about 5 minutes has generally been found to suffice in pacifying an infant but other time limits may be found by the user to be more suitable.

It is also possible to provide the device with a speed control member to enable the rate of rotation of the drive motor to be determined. The speed control member can be in the form of selectable gearing or a variable speed motor. Speed control might be needed only where the device is intended for use with a wide range of chair designs and/or chair weights (with the occupant being regarded as part of

the weight) such that the rocking characteristics might be quite variable .

A preferred form of clamping device comprises facing bearing surfaces for mounting onto opposed sides of the part  
5 of the chair and a movable control member for driving the two bearing surfaces towards one another. Possible control members for locking the clamping means in place comprise a screw fixing arrangement (with butterfly screws preferred for ease of use) or an off-centre cam with a pivoted  
10 operating lever.

The invention may be performed in various ways and a preferred embodiment will now be described, by way of example, with reference to the accompanying drawings, in which:-

15 Figures 1A and 1B are side and front perspective views of a child's rocking chair to which a rocking device of this invention has been attached;

Figure 2 is a side view of the rocking device of Figure 1;

20 Figure 3 is a rear view of the rocking device; and

Figure 4 is a plan view of the rocking device on the chair frame.

One conventional form of child's rocking chair comprises a continuous support frame formed from springy material so as to define a pair of rocking supports 1 and a pair of side  
25 rails 2. A sheet of canvas or the like is attached between the two rails 2 to define a support seat 3 in which a child could be placed. An automatic rocking device of this

invention is provided in the form of a unit 4 which is mounted on the curved rear support rail 5 linking the two side rails 2 (see Figure 4).

As can be seen from the detail in Figures 2 and 3 the unit 4 incorporates batteries 6 for driving a motor 7. The output shaft 8 of the motor has an arm 9 extending from it and at the extreme end a pendulum weight 10 is attached. A top plate 11 is mounted over the support rail 5 and the mounting unit is then firmly held in place by operating a pair of wing nuts 12 to move a clamping plate 13 against the support rail 5 until a solid grip is achieved so that the unit 4 cannot move with respect to the support rail 5.

In use the motor is switched on and the rotary pendulum weight 10 creates an oscillating movement which causes the chair to rock or bounce. This relatively small mechanical action automatically creates the momentum required and the initial movement is magnified by the intrinsic properties of the chair to provide a soothing rhythmic motion for the baby. This generally pacifies a crying baby and will often send it to sleep within 3 to 4 minutes.

The leverage of the baby's weight on the chair creates the required frequency and amplitude of motion. Since there may be variations in chair design and weight of the baby placed in the chair it might be advantageous to be able to operate the motor at differing speeds to create the right amplitude of oscillation for the particular characteristic of the chair and occupant. As can be seen from Figure 4 the top plate 11 is provided with a speed control knob 14. This



could either act through gearing or a variable speed motor. It is also desirable to be able to control the length of time of operation of the device and a time control knob 15 is provided to set the number of minutes during which the motor will be activated. A clockwork or electrical timer could be used. In this particular example a 3v Dc motor will be used to propel the off-centre pendulum with a weight of approximately 20 grams and at the end of an arm about 70 mm in length at speeds ranging between 60 to 160 revolutions a minute. As shown the rotation of the pendulum is generally at right angles to the plane in which the side rails 2 of the chair lie. It is envisaged that a suitable oscillating motion could be achieved even if the device is set by up to perhaps 45° out of this optimum angle.

CLAIMS

1. A device for initiating and maintaining a rocking motion to a rocking chair and comprising a mounting unit incorporating a rotary oscillator weight and a drive motor for imparting a rotary drive to the oscillator, and clamping means for removably attaching the mounting unit to a remote part of the rocking chair with a solid grip such that the direction of the axis of rotation of the drive shaft of the drive motor has a major component at right angles to the vertical.

2. A device according to Claim 1, wherein the oscillator comprises a pendulum weight on an arm projecting generally at right angles from the drive shaft of the drive motor.

3. A device according to Claim 1, wherein the oscillator is a disc onto which the drive shaft of the drive motor is fixed at a generally central position of the disc, such that the weight of the disc is imbalanced with respect to the drive axis.

4. A device according to Claim 3, wherein an imbalance weight is formed at or near a portion of the perimeter of the disc.

5. A device according to any one of Claims 1 to 4, wherein the drive motor is a clockwork motor or a battery driven electrical motor.

6. A device according to any one of Claims 1 to 5, wherein a timing member is provided to enable the time of

operation of the drive motor to be determined.

7. A device according to any one of Claims 1 to 6, wherein a speed control member is provided to enable the rate of rotation of the drive motor to be determined.

5 8. A device according to Claim 7, wherein the speed control member is in the form of a selectable gearing or means for applying friction control onto the drive shaft of the drive motor.

10 9. A device according to any one of Claims 1 to 8, wherein the clamping means comprises facing bearing surfaces for mounting onto opposed sides of the part of the chair and a movable control member for driving the two bearing surfaces towards one another.

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